understood that each block of the flowchart and/or block diagram illustrations, and combinations of blocks in the flowchart and/or block diagram illustrations, may be implemented by computer program instructions. These computer program instructions may be provided to a processor of a general purpose computer, a special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions, which execute via the processor of the computer or other programmable data processing apparatus, create means for implementing the functions specified in the flowchart and/or block diagram block or blocks.

These computer program instructions may also be stored in a computer usable or computer-readable memory that may direct a computer or other programmable data processing apparatus to function in a particular manner, such that the instructions stored in the computer usable or computer-readable memory produce an article of manufacture including instructions that implement the function specified in the flowchart and/or block diagram block or blocks.

The computer program instructions may also be loaded onto a computer or other programmable data processing apparatus to cause a series of operational steps to be performed on the computer or other programmable apparatus to produce a computer implemented process such that the instructions that execute on the computer or other programmable apparatus provide steps for implementing the functions specified in the flowchart and/or block diagram block or blocks.

Referring now to the flowchart diagram of **Figure 6**, operations begin at block **600** with the estimation of parameters associated with known fields of a received symbol sequence. The estimated parameters at block **600** may include C, N, C/(I+N), I/N or other such quantities. Using the parameter estimates from block **600**, an initial decision is made as to which demodulation type should be performed at each unknown field/block (block **605**). With reference to each adjacent pair of known fields/blocks, it is determined whether conventional demodulation has been selected for the unknown field with reference to both adjacent known fields (block **610**). If so (block **610**), it is determined whether to perform demodulation in one direction (uni-directional demodulation) or to demodulate starting from both known fields (bi-directional demodulation) (block **615**). For example, uni-directional demodulation (block **625**) may be selected if a difference between the estimated signal characteristics of the adjacent known blocks satisfies a difference criterion, such as

where one of the known fields has a significantly better signal quality compared to the other known field. Where the difference between the estimated signal characteristics does not satisfy the difference criterion, bi-directional demodulation may be selected (block **620**).

Bi-directional demodulation at block **620** may, for example, start from both known fields and proceed until midway through the unknown block between the known fields. Uni-directional demodulation at block **625** may start from the known field with a better signal quality and proceed until the other known field is reached. Thus, the direction of demodulation may be based on which of the known blocks has the better estimated signal characteristics.

Where conventional demodulation is not selected for both of the known blocks (block **610**) in other words, where, for example, interference cancellation (joint demodulation) is chosen for at least one of the known blocks, this indicates that there may be an interferer present in at least one of the known blocks. In accordance with the present invention, it may then be desirable to determine whether there is a point in the unknown block of the slot between the two known fields where there is no longer any discernible interference present, for example, due to the beginning of a time misaligned interferer slot reflecting a change in the power of the interferer signal. Accordingly, an interferer signal characteristic discontinuity location in the unknown block is searched for and detected as an interferer boundary (block **630**). By identifying interferer boundary or discontinuity locations, such as may be due to time-slot power control on the interferer transmission, it may be possible to improve demodulation across the unknown block.

Various approaches may be used to locate the interferer boundary in accordance with the present invention. For example, a first demodulation may be performed over the unknown data block and it may be determined from the residual error (from the demodulation metric) whether there is any abrupt change in I+N power over this portion of the slot. An alternative approach would be to search explicitly for any known sequences that might exist in the interferer data, such as synchronization or other sequences.

If an interferer boundary is detected (block **635**), the location of any fields (symbols) in the interferer signal that can be used to improve estimation of interferer quantities which can be used for interferer cancellation (such as joint demodulation)

are determined and these quantities are then estimated (block **645**). Note, that these fields may have already been located by operations at block **630** as described above. If no interferer boundary is detected (block **635**), bi-directional demodulation is utilized using the demodulation type chosen at each respective known field (block **640**). Bi-directional demodulation at block **640** also proceeds where an interferer boundary is detected after estimation of the interferer parameters (block **640**).

The bi-directional demodulation approach may proceed using the demodulation type selected at each respective known block until each technique reaches the identified interferer boundary when an interferer boundary is detected at block **635**. Otherwise, if no interferer boundary is detected at block **635**, the two demodulation approaches from each of the respective known blocks may proceed until they meet, for example, halfway through the unknown data block to be demodulated.

The operations described above with reference to **Figure 6** were described in the context of a signal having two adjacent known symbol blocks, such as illustrated in **Figure 2.** Operations with reference to an environment with only one known field, such as illustrated in **Figure 3**, will now be further described with reference to the flowchart illustration of **Figure 7**. As shown in **Figure 7**, operations begin at block **700** substantially as described with reference to block **600** of **Figure 6**. Operations at block **705** similarly proceed substantially as described with reference to block **605** of **Figure 6**. Similarly, operations at blocks **710** and **715** proceed in a manner substantially the same as described with reference to blocks **630** and **635** of **Figure 6**.

If no interferer boundary is detected (block **715**), unidirectional demodulation is utilized and proceeds from the known block until the end of the unknown data block using the chosen demodulation type for the known block (block **720**). If an interferer boundary is detected (block **715**), interferer characteristics estimates are updated at block **725,** substantially as described with reference to block **645** of **Figure 6**. Multi-mode demodulation is then performed (block **730**).

Operations at block **730** may proceed by starting demodulation from the known block using the chosen demodulation type for the known block. Operations proceed using this type of demodulation across the unknown data block until the interferer boundary is reached. Once the interferer boundary is reached, the demodulation type for the unknown block may switch to the other demodulation type